



Attorney Docket No. 2004_0589A
Serial No. 10/828,340
February 27, 2007

AMENDMENTS TO THE CLAIMS

1-16. (Canceled)

17. (Currently Amended) A method for collecting acrylic acid comprising:

(1) providing a collection column to which a first, second, third, fourth, and fifth lines are respectively connected, wherein

a first line is connected at the bottom of the collection column;

a second line is connected to the collection column at a higher position than the bottom;

a third line is connected to the first line and to the collection column at a higher position than the position where the second line is connected, and has a heat-removing device;

a fourth line is connected to the collection column at a higher position than the position where the third line is connected; and,

a fifth line is connected at the top of the collection column, which is a higher position than the position where the fourth line is connected;

(2) introducing a reaction gas from the second line into the collection column at a temperature of 140 to 250°C, the reaction gas comprising acrylic acid obtained by catalytic vapor-phase oxidation of propane, propylene, and/or acrolein;

(3) introducing an aqueous medium from the fourth line into the collection column at a temperature of 20 to 50°C whereby the acrylic acid in the reaction gas is collected in the aqueous medium to produce an acrylic acid aqueous solution;

(4) causing the acrylic acid aqueous solution as bottoms to flow out from the bottom of the collection column through the first line;

(5) causing the reaction gas remaining after the collection step to flow out from the top of the collection column through the fifth line;

(6) introducing the acrylic acid aqueous solution of the first line into the collecting column through the third line; and

(7) performing heat removal in the collection column by using a the heat-removing device on the collection column to maintain the following condition: $0.8 < (B/A) < 1.25$, wherein A

represents a weight fraction of acrylic acid to all condensable ingredients in the reaction gas before collecting acrylic acid and B represents a weight fraction of acrylic acid in the bottom of the collection column bottoms.

18. (Currently Amended) The method according to claim 17, wherein the aqueous medium introduced from the fourth line into the collection column is an aqueous solution that comprises at least 90 wt% of water.

19. (Previously Presented) The method according to claim 17, wherein the temperature at the top of the collection column is 72°C or less, and the temperature of the bottom at the collection column is 86°C or less.

20. (Currently Amended) The method according to claim 17, wherein a water content in the aqueous medium introduced from the fourth line into the collection column is 0.5- to 2-fold of a water content in the reaction gas introduced into the collection column.

21. (Previously Presented) The method according to claim 17, wherein a degree of fluctuation of the temperature at the top of the collection column is within 2°C in steady operation conditions.

22. (Previously Presented) The method according to claim 21, wherein the temperature at the top of the collection column is kept within $\pm 1^{\circ}\text{C}$ of a temperature in steady operation conditions.

23. (Currently Amended) The method according to claim 17, wherein the aqueous medium introduced from the fourth line into the collection column comprises at least 90 wt% of water, and the water content in the aqueous medium is 0.5- to 2-fold of a water content in the reaction gas introduced into the collection column.

24. (Previously Presented) The method according to claim 23, wherein a degree of fluctuation of the temperature at the top of the collection column is within 2°C in steady operation conditions.

25. (Previously Presented) The method according to claim 24, wherein the temperature at the top of the collection column is kept within $\pm 1^{\circ}\text{C}$ of a temperature in steady operation conditions.

26. (Currently Amended) The method according to claim 17, wherein the aqueous medium introduced from the fourth line into the collection column comprises at least 90 wt% of water, wherein the water content in the aqueous medium is 0.5- to 2-fold of a water content in the reaction gas introduced into the collection column, and B/A is $0.8 < (\text{B}/\text{A}) \leq 1.15$.